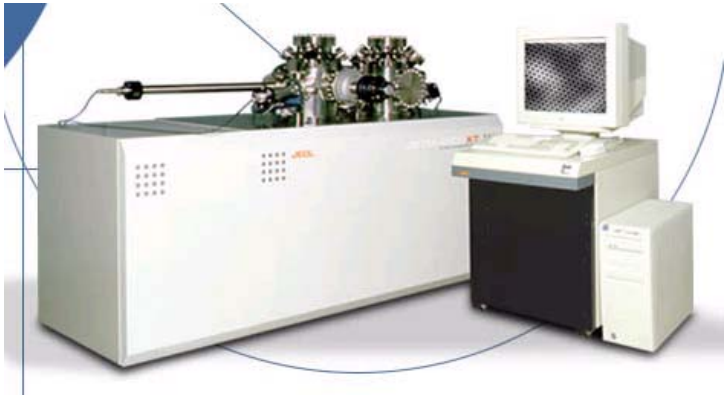
An Integrated STM/AFM/FESEM/Difference Frequency STM

A key problem in many nanotechnology investigations is the simultaneous definition and visualization of structures and their properties. Working with JEOL, using NSF support, a tool has been developed at Penn State that allows probe-based lithography with simultaneous manipulation/characterization and imaging capabilities. This allows structures to be made and measured simultaneously. Capabilities available include, FESEM, AFM, and STM based on difference frequency , with RF spectroscopy.



A picture of the Integrated tool with its transfer arm.

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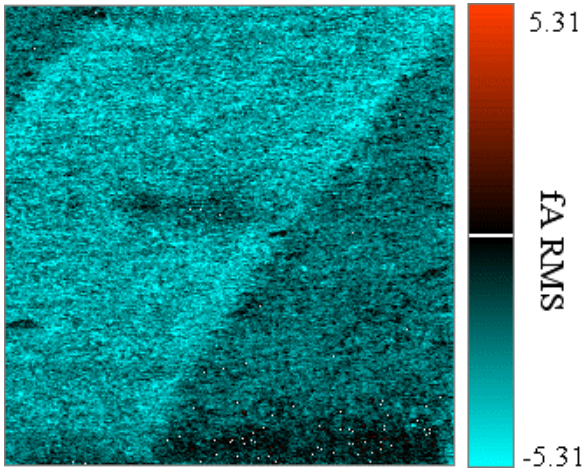
An Integrated AFM/FESEM/Difference Frequency STM for Nanostructure Manipulation and Visualization

The tool enables measurement in both hard and soft system.

For example, imaging of lipid membrane, molecular differentiation through probe spectroscopies, and evaluation of the performance of MEMS structures.



Difference frequency STM imaging. Here utilized for determining dopant density on a silicon sample

Simultaneous imaging

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